

1 performing the aggregation prior to the join only if a determination is made  
2 that it is optimal to perform an aggregation prior to the join.

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4 **REMARKS**

5 Applicant respectfully requests reconsideration and allowance of the subject  
6 application. No claims are amended, added or canceled. Claims 1-26 are pending  
7 in this application.

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9 **35 U.S.C. § 102**

10 **Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24**

11 Claims 1, 8, 9, 11, 12, 17, 19, 21 and 24 are rejected under 35 U.S.C.  
12 §102(b) as being anticipated by U.S. Patent Number 5,781,896 issued to Dalal  
13 (hereinafter "Dalal"). Applicant respectfully traverses the rejection.

14 **Claim 1** recites "a method for processing a database query," comprising:  
15 "partially pre-aggregating records in a database according to a single grouping  
16 column" "to provide a result that contains at least two records having like grouping  
17 column values." Claim 1 also recites the step of "aggregating records derived  
18 from the partial pre-aggregation to provide a result that contains records having  
19 unique grouping column values."

20 Partial aggregation is defined in the specification (p. 15):

21 [T]he output stream from pre-aggregation may contain  
22 multiple records related to the same customer, each one  
23 covering a subset of that customer's invoices.  
24 Traditional, complete aggregation always outputs a  
25 single record for each customer. This is the difference  
between *partial* pre-aggregation and pre-aggregation.

A partial aggregation (or pre-aggregation as used in the example) is an  
incomplete aggregation, so to speak, that may be performed as a preliminary step

1 in a database query. Normally after an aggregation is completed, no two records  
2 contain a grouping column value that is the same as the grouping column value of  
3 another record.

4 It is Applicant's assertion that the Dalal reference does not disclose or  
5 anticipate such a scheme.

6 The Office Action, in response to Applicant's previous arguments (see  
7 Heading 6.) states that "multiple aggregation query in Dalal is a query that utilized  
8 more than one grouping column, aggregating one grouping column at a time,  
9 sequentially – this is clearly partial aggregation (citation omitted).

10 The precise words of the Examiner's statement lend credence to Applicant's  
11 argument that multiple-level aggregation is not partial aggregation. Dalal does  
12 disclose a scheme in which aggregation of one grouping column at a time is  
13 shown. A first grouping column ("Salesperson") is aggregated completely (see  
14 Fig. 11), i.e. there are no two identical grouping column values in the grouping  
15 column of the aggregation result. Then, a second grouping column ("Division") is  
16 aggregated completely, i.e. there are no two "Division" values that are identical.

17 Dalal does not disclose or anticipate only partially aggregating each  
18 grouping column. The examples shown and described in Dalal clearly indicate  
19 that a full aggregation is performed on the grouping columns because after each  
20 aggregation, each grouping column value in the grouping column that was  
21 aggregation is unique, i.e. no two grouping column values are alike.

22 If the example shown in Dalal is applied to claim 1, then a first partial pre-  
23 aggregation on the "Salesperson" grouping column would produce a result that  
24 contained non-unique grouping column values. Then the first aggregation  
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1 referenced above would be performed on the partial pre-aggregation result, so that  
2 each grouping column value was unique in the final result.

3 Then, a second partial pre-aggregation on the "Division" grouping column  
4 would produce a result that contained non-unique grouping column values. Then  
5 the second aggregation referenced above would be performed on the partial pre-  
6 aggregation result, so that each grouping column value was unique in the final  
7 result.

8 In summary, the multiple-level aggregation disclosed in Dalal is not partial  
9 aggregation. As a matter of logic, the aggregations included in the multiple-level  
10 aggregation have to be performed sequentially. However, this does not amount to  
11 the partial pre-aggregation that is required by claim 1.

12 Accordingly, claim 1 is not anticipated by Dalal and is allowable over the  
13 cited reference. The rejection, therefore, should be withdrawn.

14 **Claims 8, 9 and 11** depend from claim 1 and are allowable by virtue of that  
15 dependency.

16 **Claim 12** recites a relational database system that includes, *inter alia*, a  
17 record store and a query processor configured "to process a query on the record  
18 store according to a single grouping column, the query processor being configured  
19 to partially pre-aggregate the record store to provide a result that contains at least  
20 two data records that have like grouping column values."

21 As previously discussed in the response to the rejection of claim 1, a typical  
22 aggregation does not result in any two records having an identical grouping  
23 column value as required by claim 12. The operations referred to in Dalal are  
24 sequential aggregations - one follows the other. But these sequential aggregations  
25 are two independent, complete aggregations - neither of the sequential

1 aggregations is a partial aggregations. Therefore, Dalal does not disclose or  
2 anticipate a partial aggregation or partial pre-aggregation.

3 Accordingly, claim 12 is allowable over the cited reference and the  
4 rejection thereof should be withdrawn.

5 **Claims 17 and 19** depend from claim 12 and are allowably at least by the  
6 same reasoning discussed in the response to the rejection of claim 12. Therefore,  
7 the rejection of claims 17 and 19 should also be withdrawn.

8 **Claim 21** recites a relational database computer program that comprises  
9 “partial pre-aggregation code to partially pre-aggregate data records according to  
10 grouping column values in a single grouping column to provide a partial pre-  
11 aggregation result having two or more records having like grouping column  
12 values.” The relational database computer program also includes “aggregation  
13 code” that aggregates the result of the partial pre-aggregation.

14 As previously discussed, Dalal merely discloses a multiple level  
15 aggregation that does not include partial aggregation. Therefore, Dalal does not  
16 disclose or anticipate a partial pre-aggregation operation as required in claim 21. .

17 Accordingly, claim 21 is allowable over the cited references and the  
18 rejection of claim 21 should be withdrawn.

19 **Claim 24** recites a relational database computer program comprising  
20 computer-executable instructions that perform several steps. The steps include  
21 “aggregating the input records in the stream according to a single grouping  
22 column” to create a record store, “joining records in the record store with other  
23 data,” outputting the records from the join and aggregating the records output from  
24 the join. Claim 24 also makes clear that “the records output from the join include  
25 at least two records that have an identical grouping column value in the single

1 grouping column.” This restriction, in essence, renders the first aggregating step a  
2 partial aggregation.

3 As previously discussed, the cited reference only describes an aggregation  
4 or a multiple level aggregation, wherein no records output from an aggregation  
5 contain an identical value in the grouping column. The identical values cited in  
6 the Office Action are contained in a grouping column on which the aggregation  
7 was not performed. The operations disclosed in Dalal are merely typical  
8 aggregations that completely aggregate records on a grouping column so that no  
9 record resulting from the aggregation contains an identical value in the aggregated  
10 grouping column. This is contrary to claim 24. After a first complete aggregation  
11 is performed, a second complete aggregation is performed on another grouping  
12 column.

13 Claim 24 clearly recited a partial aggregation that is not disclosed in any  
14 reference. As a result, claim 24 is allowable over Dalal and the rejection thereof  
15 should be withdrawn.

16 **35 U.S.C. § 103(a)**

17 **Claims 2-5, 13-15, 20, 22, 23 and 25**

18 Claims 2-5, 13-15, 20, 22, 23 and 25 stand rejected under 35 U.S.C. 103(a)  
19 as being unpatentable over Dalal in view of U.S. Patent Number 6,115,705 issued  
20 to Larson (hereinafter “Larson”). Applicant respectfully traverses the rejection.

21 **Claims 2-5** depend from claim 1 and are allowable at least by virtue of that  
22 dependency for the reasons stated in the response to the rejection of claim 1.  
23 Neither reference teaches or suggests a partial aggregation or partial pre-  
24 aggregation. As discussed above, this makes the claims allowable over the cited  
25 references and the rejection of these claims should be withdrawn.

**Version of Amended Claims With Markings to Show Changes Made**

No claims are amended.

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1        **Conclusion**

2        All pending claims 1-26 are in condition for allowance. Applicant  
3 respectfully requests reconsideration and prompt issuance of the subject  
4 application. If any issues remain that prevent issuance of this application, the  
5 Examiner is urged to contact the undersigned attorney before issuing a  
6 subsequent Action.

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9        Date: 3/12/03

Respectfully Submitted,

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